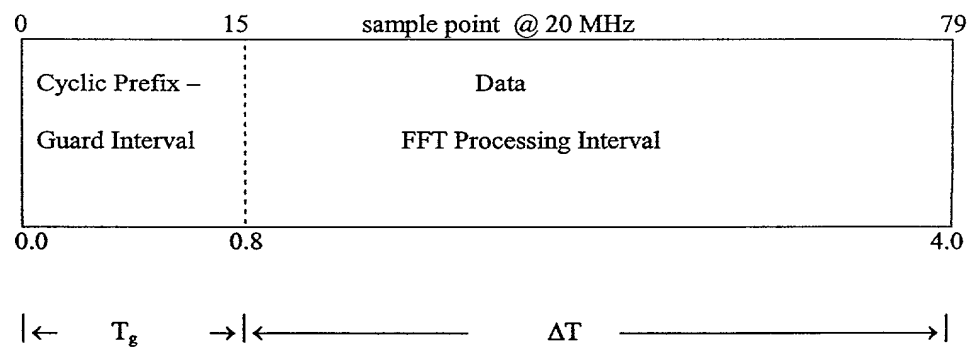
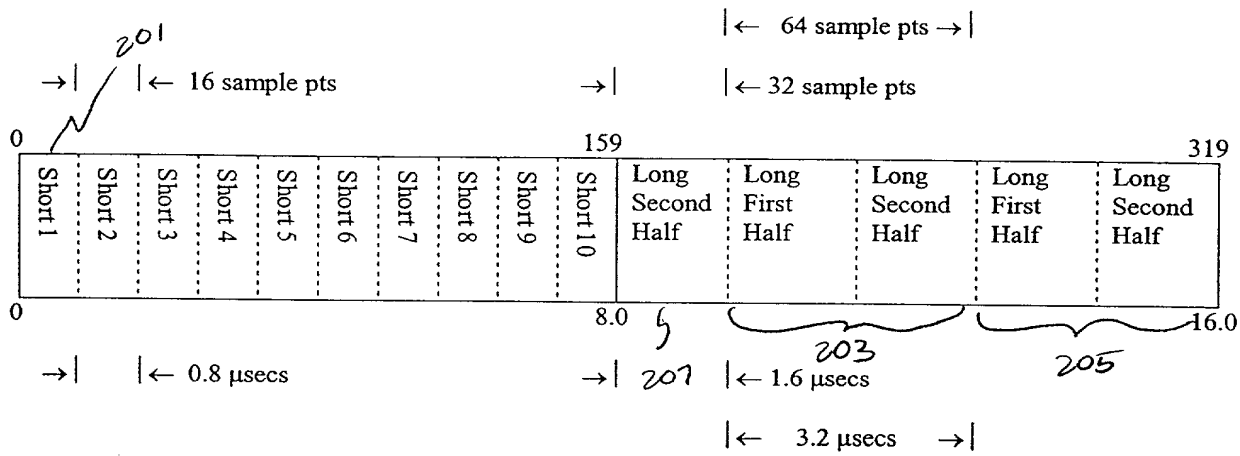


a.) Data and Pilot Sub-Carriers



b.) OFDM Data Symbol Structure

Fig. 1 OFDM WLAN PHY Layer Data Symbols



**Fig. 2 OFDM WLAN Preamble Structure**  
(20 MHz Sample Rate)

0995912 051801

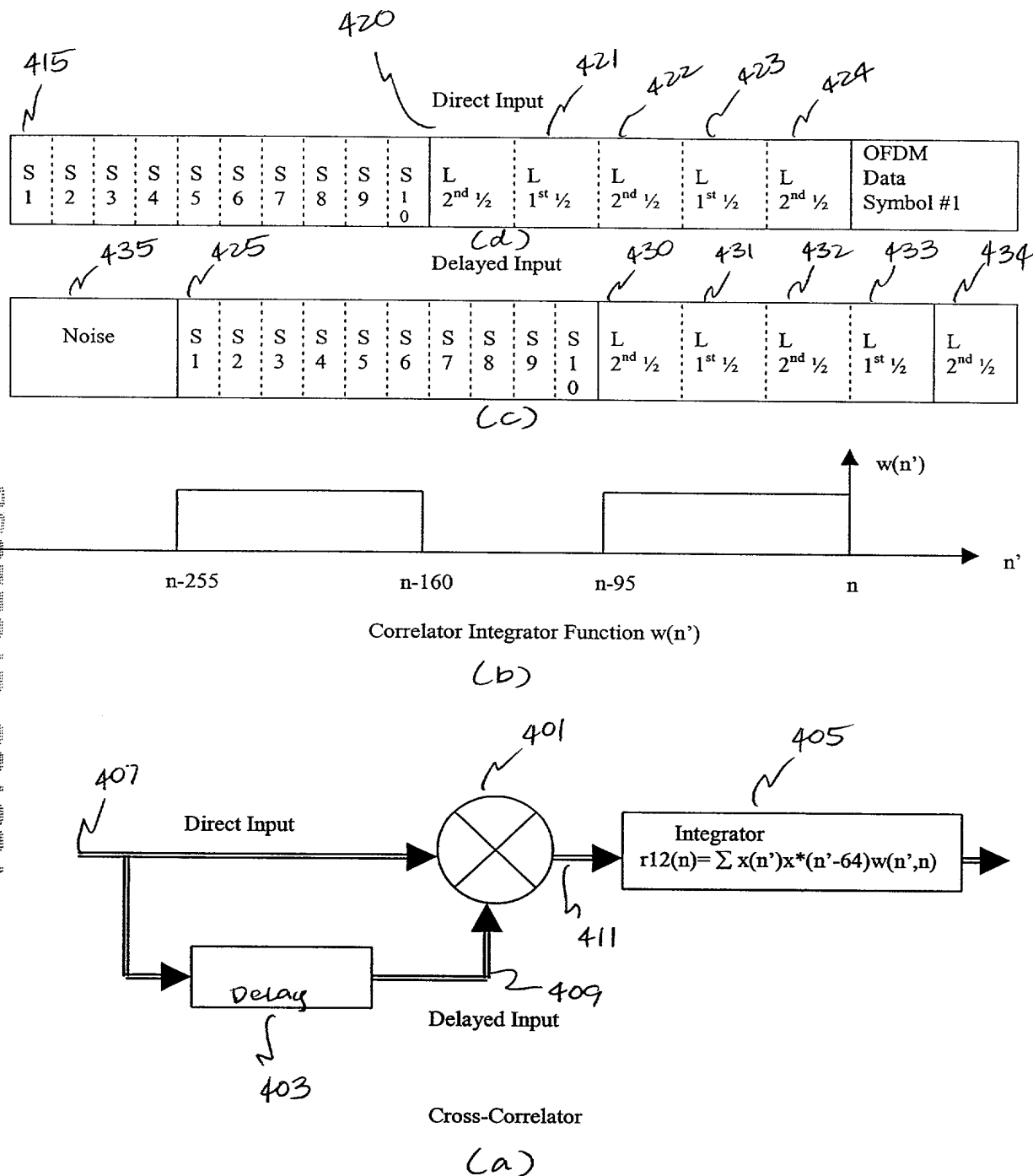
$$2^{1/2} \cdot \{ 0, 0, 1+j, 0, 0, 0, -1+j, 0, 0, 0, -1-j, 0, 0, 0, 1-j, 0, 0, 0, -1-j, 0, 0, 0, 1-j, 0, 0, 0, 0, 0, 0, 0, 0, 1-j, 0, 0, 0, 0, 0, 0, 0, 0, 1-j, 0, 0, 0, -1-j, 0, 0, 0, 1-j, 0, 0, 0, -1-j, 0, 0, 0, -1+j, 0, 0, 0, 1+j, 0, 0 \}$$

a.) Short Sync Modulation Values -  $S_{-26}$  to  $S_{26}$

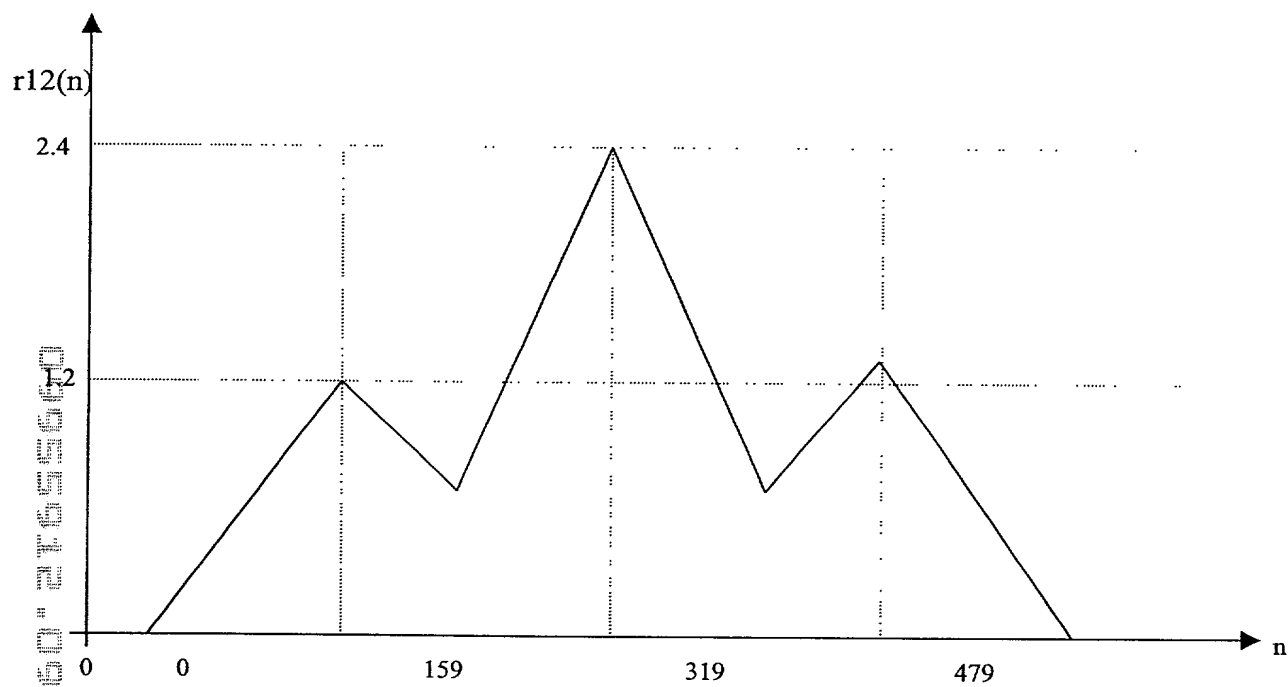
$$\{ 1, 1, -1, -1, 1, 1, -1, 1, -1, 1, 1, 1, 1, 1, 1, -1, -1, 1, 1, -1, 1, -1, 1, 1, 1, 1, 0, 1, -1, -1, 1, 1, -1, 1, -1, 1, -1, -1, -1, -1, -1, 1, 1, -1, -1, 1, -1, 1, -1, 1, 1, 1, 1 \}$$

b.) Long Sync Modulation Values -  $L_{-26}$  to  $L_{26}$

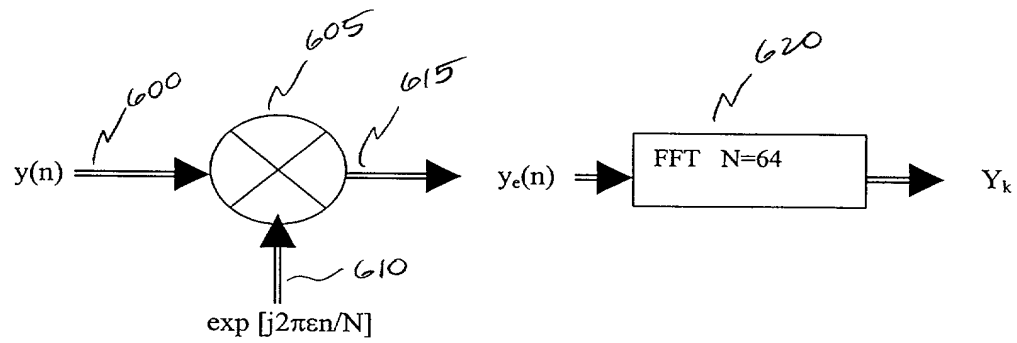
**Fig. 3 Short and Long Sync Symbol Modulation Values**



**Fig. 4 Cross-correlator, preamble inputs and integrator weighting function for initial iteration of the frequency offset and timing synchronization of OFDM WLAN**



**Fig. 5 Magnitude of Cross-Correlator Output versus preamble sample point number**



**Fig. 6 Fine frequency offset correction and extraction of sub-carrier modulation values**

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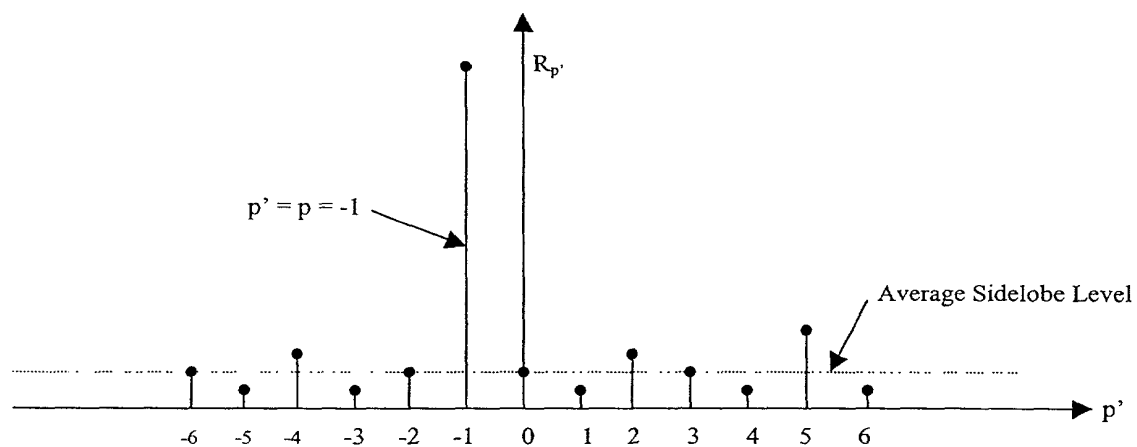


Fig. 7 Correlation between interpolated and actual odd frequency channel estimates for integer frequency offset  $p = -1$

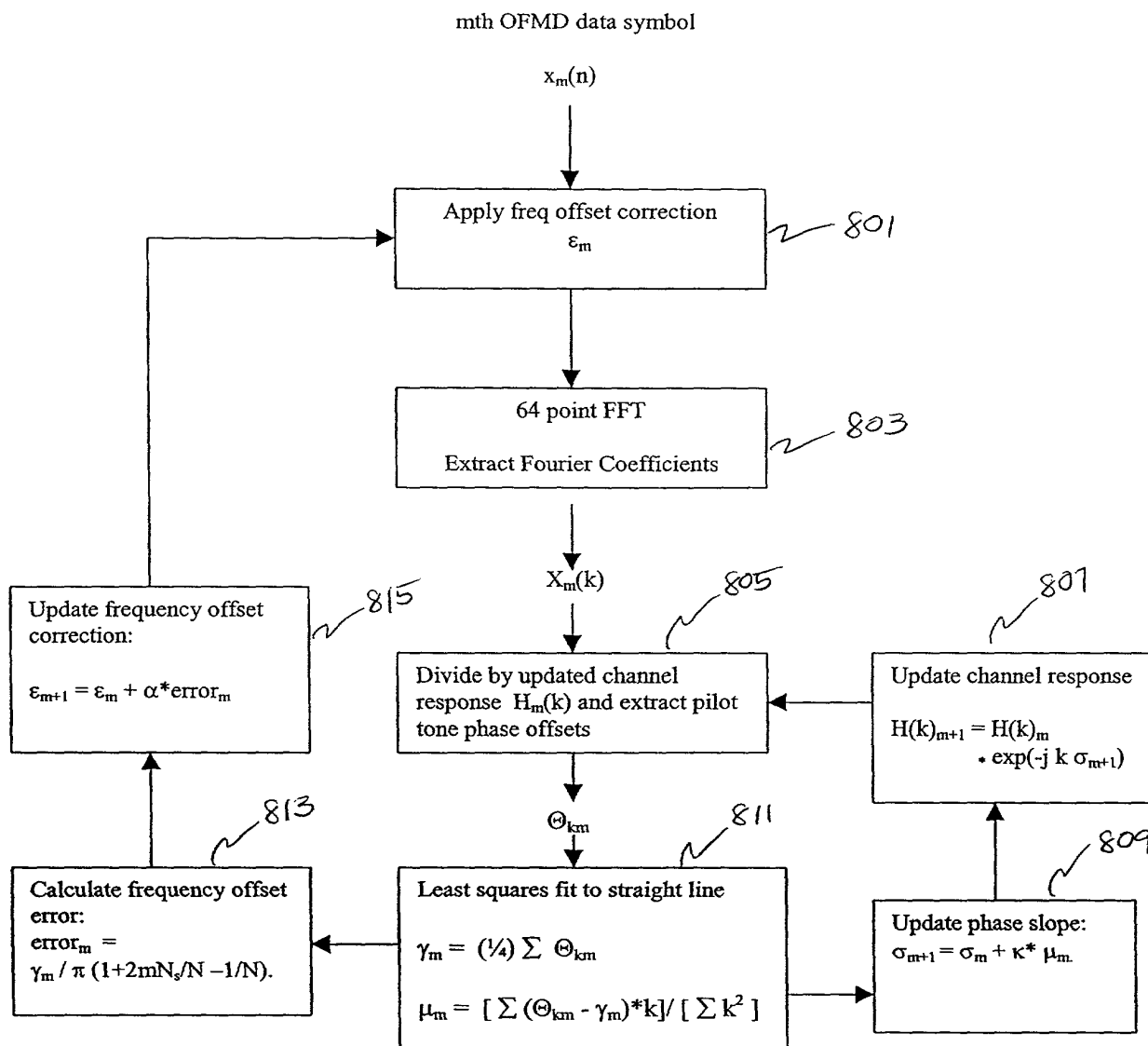


Fig. 8 Pilot tone tracking loop